Cold Weather Operating Performance

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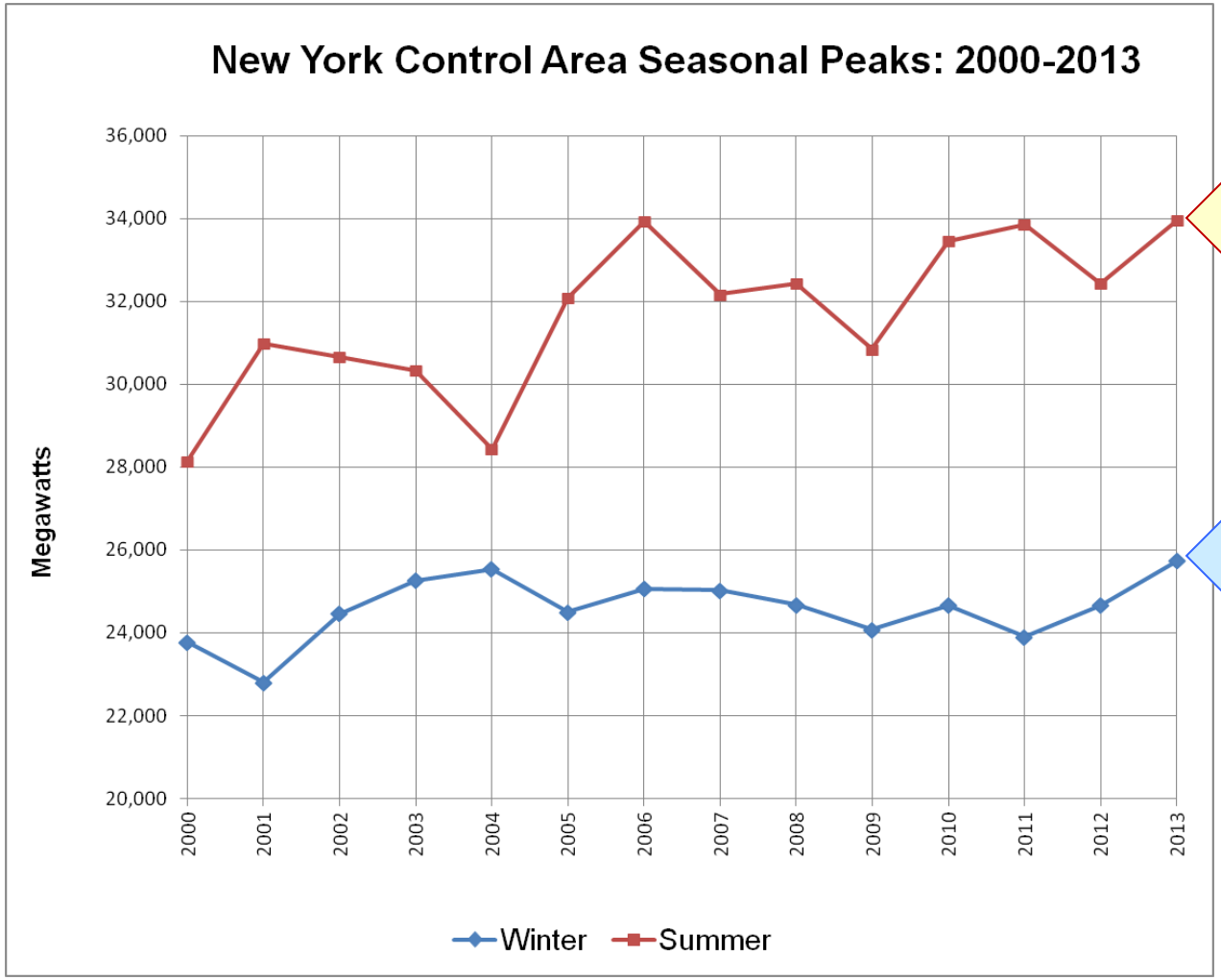
DRAFT – FOR DISCUSSION PURPOSES ONLY

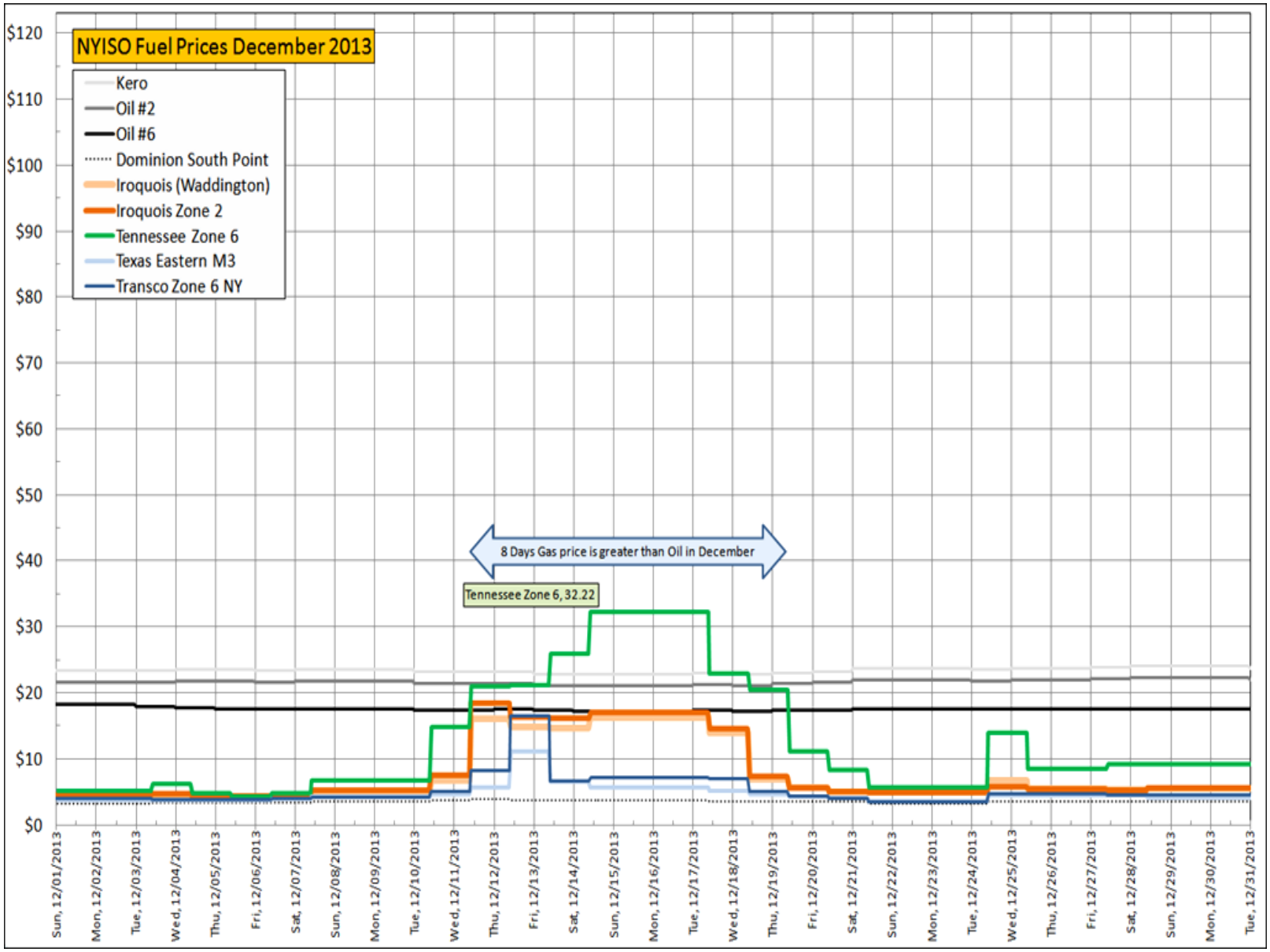
Executive Summary

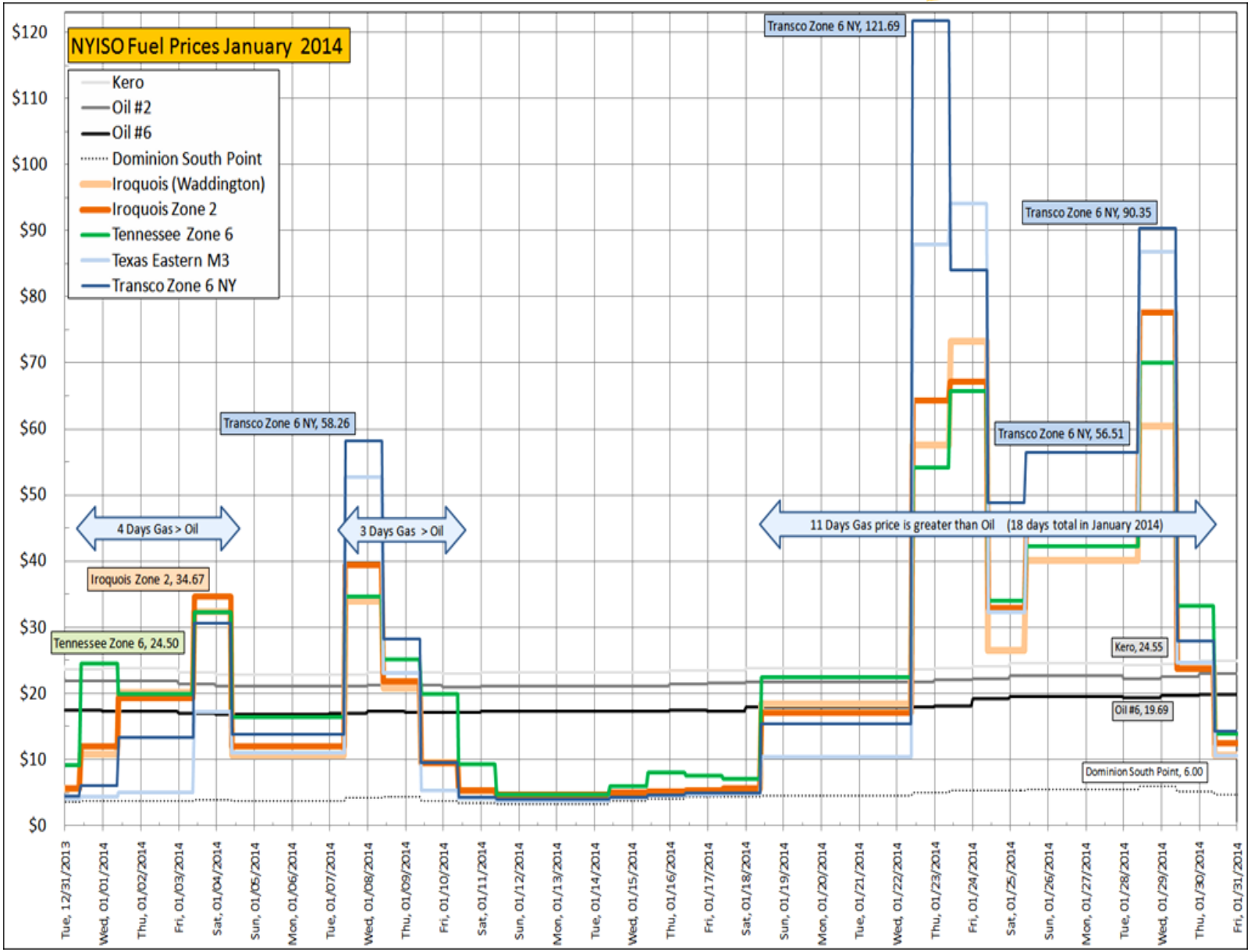
- **Winter 2013-2014 included five major "Cold Snaps" – with three Polar Vortexes that extended across much of the country.**
- **On January 7, the NYISO set a new record Winter Peak load of 25,738 MW.**
  - ***25,541 MW -- Prior record winter peak load set in 2004***
  - ***24,709 MW -- "1 in 2" Forecast Winter Peak for 2013-14***
  - ***26,307 MW -- "1 in 10" Forecast Winter Peak for 2013-14***
- **Operations efforts during early January cold weather events were related to managing generator capacity de-rates.**
- **Operations efforts in later January were related to managing potential fuel depletions that could lead to capacity de-rates.**

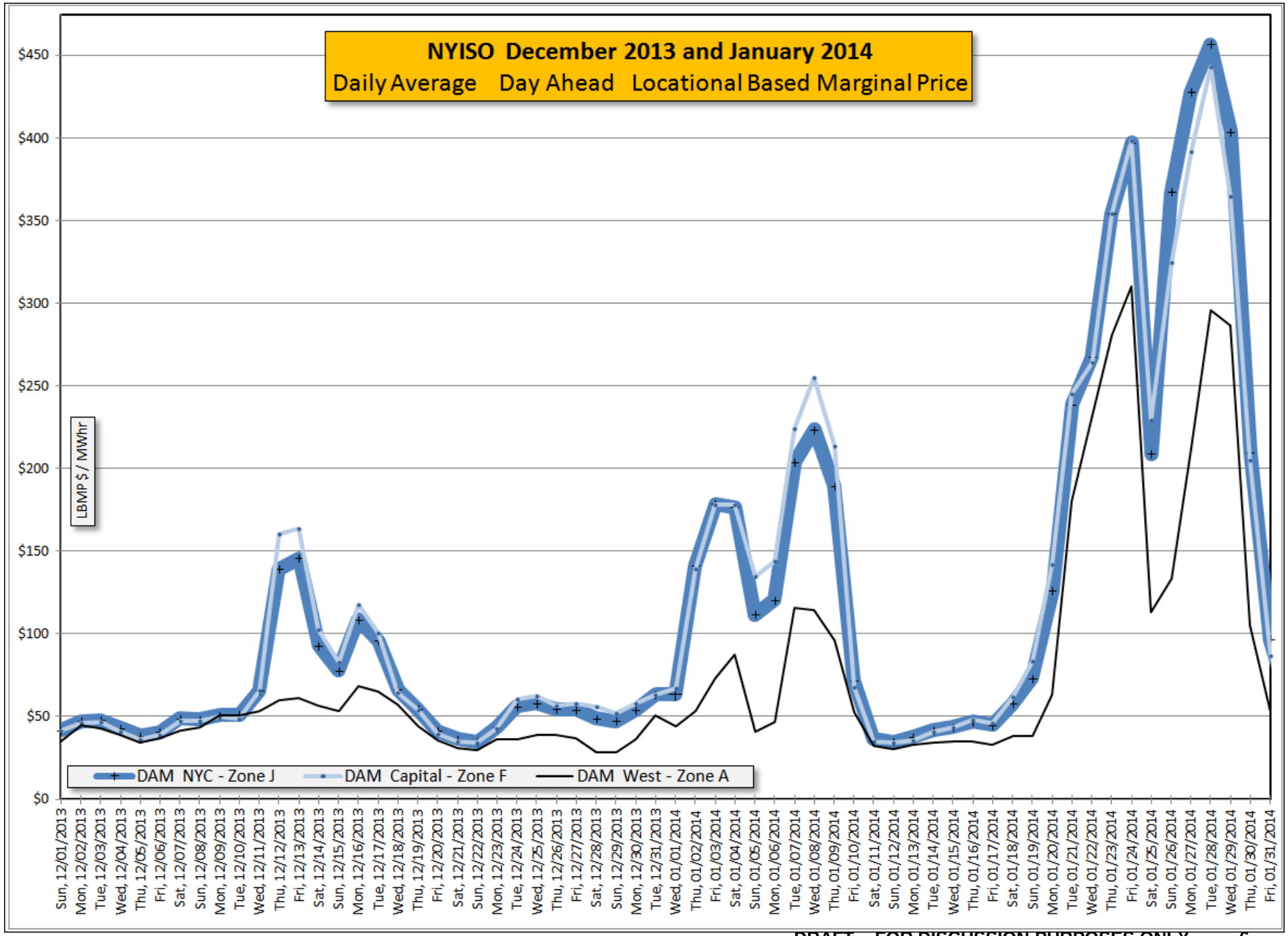


Record Summer Peak
33,956 MW
July 19, 2013

Record Winter Peak
25,738 MW
January 7, 2014







Preparation

- **Prior to Winter 2013-2014**
  - *Conducted a fuel survey for both gas transportation arrangements and oil inventory and replenishment capability (oil transportation capability)*
  - *Produced a Winter Assessment inclusive of base assumptions and stress cases for loss of all gas, 90/10 peak, and oil burn rates relative to oil replenishment rates*
- **Prior to each cold snap**
  - *Participated in several NPCC/PJM conference calls*
  - *Worked with the NY Transmission Owners to cancel some transmission outages*
  - *Invoked "Cold Weather Procedure" to confirm day-ahead gas nominations and oil inventories with NY generation owners*
- **Preparation during mid January cold snap**
  - *NYISO requested, and FERC granted, a waiver request for supplier recovery of costs in excess of the $1,000/MWh offer cap: Effective January 22 – February 28.*
  - *Toward the end of January, with sustained cold snaps, oil depletion concerns led to increased NYISO efforts to manage projected unit capability on alternate fuels.*

Operating Performance

Early January

- *On January 6 -- NYPA 345kV Y49 cable tripped early morning and remained out-of-service through January 16*
- *On January 7 -- breakers at the 345 kV Beck Station tripped, opening the Beck-Niagara 345 kV PA-302*
- *Significant generation de-rates in early January*
- *NYISO Supplemental Resource Commitments*
- *DR activated on January 7*
- *Public Appeals for customers to curtail non-essential use on January 7*
- *NERC Energy Emergency Alert 1 issued January 7 -- indicating that the NYISO was meeting reserve requirements*

Operating Performance

Late January

- *Initially, weather forecasts projected another Polar Vortex for the week of January 27-31. Preliminary load forecasting for 26,000 MW – predicted new record winter peak – by Tuesday, January 28 (This did not occur)*
- *Began to see the potential for oil depletion, and reported difficulty receiving fuel deliveries (barges and trucks) – as well as procuring fuels that met permit requirements*
- *NYISO Supplemental Resource Commitments due to the uncertainty of oil deliveries and the uncertainty of nominating gas*
- *DR on notice for NYC zone January 27 for possible need on January 28 (Was not activated on January 28)*
- *TVA Transmission Loading Relief (TLR) impacted some Northeast transactions*

Operating Performance

Date	Total Derates	% Fuel/Cold	% Non-Weather or Fuel
Dec. 17, 2013	489 MW	58% (286 MW)	42% (203 MW)
Jan. 3, 2014	2,549 MW	32% (807 MW)	68% (1,743 MW)
Jan. 7, 2014	4,135 MW	54% (2,236 MW)	46% (1,900 MW)
Jan. 21, 2014	900 MW	26% (241 MW)	74% (660 MW)
Jan. 22, 2014	1,162 MW	45% (519 MW)	55% (643 MW)
Jan. 28, 2014	272 MW	15% (39 MW)	86% (233 MW)
Feb. 6, 2014	440 MW	17% (74 MW)	83% (366 MW)
Feb. 7, 2014	493 MW	34% (170 MW)	66% (323 MW)

Winter 2013-14 Observations

- **Winter 2013-2014**
  - ***Characterized by many days of gas prices exceeding oil prices***
  - ***Resulting in high levels of economic scheduling and dispatch of oil-fired generation***
- **Load weighted electric LBMP for January was $183/MWh**
  - ***176% increase over December 2013***
- **Natural gas prices (as indexed at Transco Zone 6 for NYC area) averaged $27.43/MMBTU**
  - ***nearly 400% increase over December 2013***
- **LBMP energy increases at less than half the natural gas price increases is indicative of NYISO market systems selecting lower-cost resources – primarily dual-fuel units capable of operating on oil**

Winter 2013-14 Observations

Dual Fuel Observations for extreme cold days

- **For short duration cold weather events, oil-fired generation was capable of receiving oil deliveries at rates close to their oil-burn rates**
- **For longer, sustained cold periods there were instances where delivery rates could not "keep up" with oil burn rates. For many days oil was economic relative to gas.**

Pipeline-related Observations for extreme cold days

- **Generally, generators with confirmed gas nominations were successful receiving gas to generate to their day ahead electric commitments, including during times of declared Operational Flow Orders (OFOs) or System Alerts.**
- **There were instances where generators connected to the interstate pipelines were able to procure and nominate gas intra-day, including instances for NYISO reliability supplemental commitments.**
- **OFOs**
  - ***The majority of the OFOs declared on the interstate pipelines required tighter daily balancing requirements, yet still allowed some flexibility.***
  - ***Often times the OFOs declared on the LDCs required both daily balancing and hourly balancing, which greatly limited generator flexibility.***

Next Steps

NYISO Markets

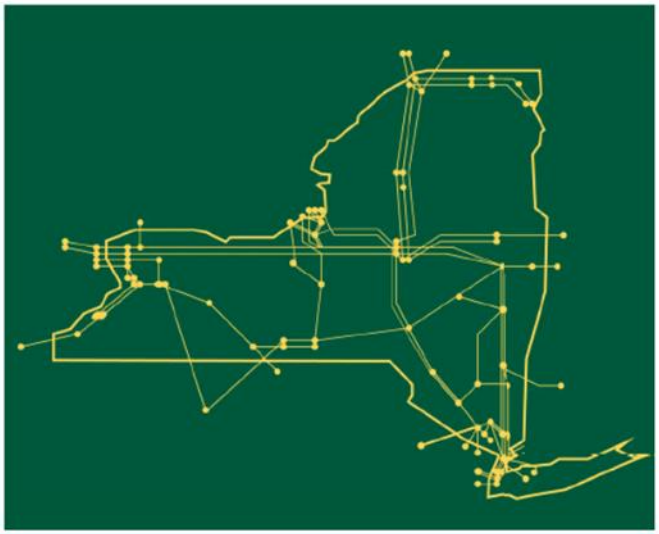
- **Explore potential market rule changes to address cold weather reliability concerns associated with:**
  - ***Significant generator de-rates***
  - ***Limited fuel supplies during long, sustained periods***
- **Consider improvements to actual generator reference level management**
- **Coordinate with PJM and ISO-NE, if either RTO considers modifications to energy bid offer caps**

Next Steps

Reliability

- **Run planning scenarios to reflect sustained cold weather, physical dual fuel inventory capability, and fuel replacement rate capabilities.**
- **Improve operator awareness of the fuel status of all generators, in addition to improved awareness of pipeline system conditions.**
- **Continue to actively participate in the regional EIPC Studies**
  - ***Incorporate findings into the NYISO planning processes***
  - ***Consider additional planning and/or market design enhancements if needed***

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



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